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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/628,694	07/28/2000	Michael Boucher	06502.0230	3427

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EXAMINER
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GROSS, KENNETH A

ART UNIT	PAPER NUMBER
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2122

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16

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/628,694	BOUCHER, MICHAEL	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kenneth A Gross	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 10, 14-19, 21-23, 26-28, 35-39, 44-49 and 51-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 10, 14-19, 21-23, 26-28, 35-39, 44-49 and 51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>14</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This action is in response to the office action filed on February 10<sup>th</sup>, 2004.
2. The final rejection mailed on September 10<sup>th</sup>, 2003 is hereby withdrawn.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 14-19, 21-22, 44-49, and 51-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Donovan et al. (U.S. Patent Number 6,072,951).

In regard to Claim 14, Donovan teaches: (a) identifying a subprogram with first and second execution characteristic. Donovan teaches gathering execution frequencies for a multiple number of paths in a procedure (Column 6, lines 25-30). Each frequency for a given path can be seen as an execution characteristic, and hence the subprogram can have two characteristics; (b) associating certain arguments that cause the subprogram to exhibit the first characteristic with a portion of the subprogram (Column 1, lines 21-25). Since the subprogram being executed is dependent on a value of the argument, the argument must be associated with the subprogram being executed, otherwise, control, program flow to continue in different directions based on the value of the variables would be *inoperative*; (c) replacing the portion of the subprogram that exhibits the first execution characteristic with program instructions that explicitly define the operations of the first execution characteristic (Column 3, lines 4-6); and (c) leaving intact a

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second portion of the subprogram that exhibits the second execution characteristic. This is inherent from Donovan, since code that doesn't have a certain execution frequency is not inlined, and hence is left intact.

Claim 44 is an apparatus Claim that corresponds with method Claim 1, and is rejected for the same reasons as Claim 1, where Donovan teaches an apparatus (Column 12, lines 65-67 and Column 13, lines 1-14) for carrying out said method of Claim 1.

In regard to Claim 15, Donovan teaches that the number of statements of a path of the subprogram can also be used as an execution characteristic for a number of portions of the subprogram (Column 9, lines 52-58). Donovan teaches that if this characteristic falls below a given threshold (the code has too many statements), then the code is inlined, and hence requires special processing to inline the program.

In regard to Claims 16 and 17, for specific rejection of these Claims, see the office action mailed on April 11<sup>th</sup>, 2003.

In regard to Claim 18, Donovan teaches that if a characteristic exceeds a threshold (the code has too many statements), then the code is not inlined, and hence the portion of code is left intact, and no special processing is performed on the code.

In regard to Claim 19, for a specific rejection of this Claim, see the office action mailed on April 11<sup>th</sup>, 2003.

In regard to Claim 21, Donovan teaches that certain arguments are associated with conditional execution computer statements associated with the first characteristic (Column 1, lines 21-25).

In regard to Claim 22, Donovan teaches that the first and second execution characteristics are invoked based on conditional execution computer statements associated with the characters (Column 1, lines 21-25).

Claims 51-52 are apparatus Claims that correspond with method Claims 21-22 and are rejected for the same reasons as Claims 21-22, respectively, where Donovan teaches an apparatus (Column 12, lines 65-67 and Column 13, lines 1-14) for carrying out said method of Claims 21-22.

Claims 45-49 are apparatus Claims that correspond with method Claims 15-19 and are rejected for the same reasons as Claims 15-19, respectively, where Donovan teaches an apparatus (Column 12, lines 65-67 and Column 13, lines 1-14) for carrying out said method of Claims 15-19.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 10, 23, 26-28, 35-39, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donovan et al. (U.S. Patent Number 6,072,951) in view of Reeve et al. (U.S. Patent Number 5,535,393).

In regard to Claim 1, Donovan teaches: (a) identifying a subprogram of a computer program, wherein the subprogram exhibits varying execution characteristics associated with

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corresponding execution paths (Column 1, lines 59-65). Donovan teaches that each subprogram is a procedure with a predefined activity. This activity can be interpreted as an execution characteristic of the subprogram; (b) identifying a range of variables associated with a first execution characteristic of the subprogram (Column 1, lines 21-25). Donovan teaches that a value of a variable can change the flow of the program. When the flow of the program changes, the characteristics of the program change due to a new flow of programming being executed; (c) associating the range of variables with a first execution path of the subprogram. This is obvious from the statement in Donovan in Column 1, lines 21-25. Since the subprogram being executed is dependent on a value of the variable, the variable must be associated with the subprogram being executed, otherwise, control, program flow to continue in different directions based on the value of the variables would be *inoperative*; (d) coding an inline directive associated with the first execution path (Column 6, lines 36-39); (e) selectively inlining computer code of the first execution path of the subprogram (Column 2, lines 56-61) based on the directive. Donovan does not teach that these directives are included as part of a program comment statement associated with the first execution path. Reeve, however, does teach embedding directives in a program comment statement (Column 7, lines 21-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of identifying a subprogram of a computer program, wherein the subprogram exhibits varying execution characteristics associated with corresponding execution paths, identifying a range of variables associated with a first execution characteristic, associating the range of variables with a first execution path of the subprogram, coding an inline directive associated with the first execution path, and selectively inlining computer code of the first execution path of the subprogram based

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on the directive, as taught by Donovan, where the directive is embedded in a program comment statement, as taught by Reeve, since this allows certain compilers to recognize the commands, and other compilers to ignore them.

In regard to Claim 2, Donovan teaches that different values of variables lead to different program flows, resulting in different execution characteristics to be demonstrated by each specific flow executed based upon the variable value (Column 1, lines 21-25).

In regard to Claim 3, Donovan teaches a method of only inlining selected paths of a child procedure, thus leaving certain paths intact (Column 2, lines 53-65).

In regard to Claim 4, Donovan teaches that a characteristic of a path in a subprogram can be the number of statements in the path (Column 9, lines 52-58). The examiner takes official notice that execution time is often estimated based on the number of statements in the program being executed.

In regard to Claim 5, Donovan teaches frequency of execution as an execution characteristic (Column 2, lines 66-67 and Column 3, line 1).

Claims 36-39 are apparatus Claims that correspond with method Claims 2-5 and are rejected for the same reasons as Claim 2-5, respectively, where Donovan teaches an apparatus (Column 12, lines 65-67 and Column 13, lines 1-14) for carrying out said method of Claims 2-5.

Claims 10 and 35 are compiler and apparatus Claims that correspond with method Claim 1 and are rejected for the same reasons as Claim 1, where Donovan teaches a compiler (Figure 1, item 40) and apparatus (Column 12, lines 65-67 and Column 13, lines 1-14) for carrying out said method of Claim 1.

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In regard to Claim 23, Donovan teaches: (a) identifying a subprogram of a computer program having a plurality of execution characteristics associated with corresponding execution paths (Column 1, lines 59-65). Donovan teaches that each subprogram is a procedure with a predefined activity. This activity can be interpreted as an execution characteristic of the subprogram. Donovan further teaches identifying a range of variables associated with a first execution characteristic of the subprogram (Column 1, lines 21-25). Donovan teaches that a value of a variable can change the flow of the program. When the flow of the program changes, the characteristics of the program change due to a new flow of programming being executed. Donovan teaches associating the range of variables with one of the execution characteristics. As said above, certain ranges of variables cause different program flows to be taken, and thus different execution characteristics to be exemplified. Donovan finally teaches associating a certain range of variables with a certain portion of the subprogram. Donovan teaches that different values of variables lead to different program flows, resulting in different execution characteristics to be demonstrated by each specific flow executed based upon the variable value (Column 1, lines 21-25); (b) inlining only a selected portion of the subprogram that corresponds to the execution characteristics. Donovan teaches that the portions of the subprogram that are executed most frequently are those that are inlined (Column 3, lines 4-6). Donovan does not teach that the selected path is determined by identifying a non-executable statement configured to direct the computer to interpret at least a portion of the non-executable statement as a special directive. Reeve, however, does teach embedding directives in a program comment statement (Column 7, lines 21-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the identifying and associating steps as noted above, as



well as the inlining step, as taught by Donovan, where the selected path is determined by identifying a non-executable statement configured to direct the computer to interpret at least a portion of the non-executable statement as a special directive, as taught by Reeve, since this allows certain compilers to recognize the directives, and other compilers to ignore them.

In regard to Claim 26, Donovan teaches putting directives in code at selected paths (Column 6, lines 36-39). Therefore it would be obvious to place the comments with embedded directives in the code at selected paths as well.

In regard to Claim 27, for a specific rejection of this claim, see the office action mailed on April 11<sup>th</sup>, 2003.

In regard to Claim 28, Donovan teaches identifying a subprogram that operates in a first manner and in a second manner and replacing subprogram statements that cause the subprogram to operate in the first manner with expanded code. Donovan teaches that execution frequencies are gathered for each path in the subprogram (Column 2, lines 66-67 and Column 3, line 1). Donovan further teaches associating the operands with the first range of values with an execution path of the subprogram (Column 1, lines 21-25). Donovan teaches that when the execution frequency of a certain path exceeds a threshold, the program path is inlined. Donovan does not explicitly teach that the first and second manners of operation occur when operands passed to the subprogram fall within two value ranges. However, Donovan teaches that program flow is altered based on different variable values. Furthermore, it is obvious that the frequency of execution of paths in a program would be altered and thus would be based on arguments operated on by a subprogram. Furthermore For example, programs can reach conditional statements, and the path that the program takes will be based on the value of the argument

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fulfilling the conditional expression. This view is supported in the Background section of the current application (Page 2, lines 16-22), and by Donovan (Column 1, lines 21-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to identify a subprogram that operates in a first manner and in a second manner, associating operands with a certain range of values with the execution path of the subprogram, and replacing subprogram statements that cause the subprogram to operate in the first manner with expanded code, as taught by Donovan, since the frequencies of program paths are obviously altered by arguments of the program.

Claim 53 is an apparatus Claim that corresponds with method Claim 28, and is rejected for the same reasons as Claim 28, where Donovan teaches an apparatus (Column 12, lines 65-67 and Column 13, lines 1-14) for carrying out said method of Claim 28.

### ***Response to Arguments***

3. Applicant's arguments filed February 10<sup>th</sup>, 2004 have been fully considered but they are not persuasive.

Specifically, the applicant argues that neither Donovan nor Reeve teach identifying and associating a range of variables and coding an inline directive as part of a program comment statement associated with an execution path with the range of variables (Page 16, lines 8-11) Donovan, however, does teach identifying variables whose value range alters the program path of a program in the background section of the patent, and thus the values must be associated with program paths that they execute (Column 1, lines 21-25), otherwise, control, program flow to continue in different directions based on the value of the variables would be *inoperative*. This

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view is further supported in the Background section of the current application (Page 2, lines 16-22), and thus can be treated as prior art. The fact that values of variables can alter the flow of a program, and thus alter the characteristics of a program sub path, is exceedingly well known in the art. Donovan does teach including an inline directive in sub paths in a subprogram. As said above, these sub paths are associated with values of variables, and hence the range of variables is associated with the sub path. Although Donovan does not teach that the directive is part of a comment statement, Reeve overcomes this deficiency (Column 7, lines 21-27), as noted above.

In regard to Claim 14, the applicant argues that Donovan does not teach associating arguments that cause the subprogram to exhibit the first execution characteristic with a portion of the subprogram (Page 18, lines 3-6). However, as stated above, Donovan does teach associating certain variable ranges with subpaths in a program, and thus the variables are associated with the subpaths that it could potentially execute.

In regard to Claims 23 and 28, the applicant makes similar arguments with regard to Claim 1, and the applicant is directed above to the responses to these arguments.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth A Gross whose telephone number is (703) 305-0542. The examiner can normally be reached on Mon-Fri 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on (703) 305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KAG



**TUAN DAM**  
**SUPERVISORY PATENT EXAMINER**